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Changes in bacterial densities and hemocyte parameters in eastern oysters,

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Juvenile oyster disease (JOD) in the eastern oyster, Crassostrea virginica, is characterized by a conchiolin deposit on the inner surface of the valves. Similarities to pathological syndromes affecting other oysters (pearl oyster mortality) and clams (brown ring disease), has suggested an infectious origin and a possible bacterial etiology. Bacteriological analysis (Total Heterotrophic Bacteria, THB and Total Vibrio sp., TVS) of oyster soft tissues, shell fluid and inner shell surfaces were monitored during the course of JOD onset and development. A significant increase in THB (but not TVS) occurred in shell fluid and at the surface of the inner shell of JOD affected oysters. At the same time, changes in cytometric parameters (Total Hemocyte Counts, THC; Differential Hemocyte Counts, DHC) in hemolymph and shell fluid were documented in symptomatic oysters. THC in the shell fluid showed a decrease in late-stage JOD oysters. The disease was also correlated with altered cell ratios in both hemolymph and shell fluid, resulting in an increase in the percentage of the granulocytes in both locations. Our results have showed that main pathological changes

associated with JOD occurred in extrapallial region rather than in the soft tissues. The disease was transmitted in the laboratory by extracts from diseased oysters: anomalous conchiolin developed within 4 weeks and the prevalence was higher when two inoculations were performed rather than one. A number of bacterial strains were found at high levels in diseased oysters and isolated. However, none produced the JOD deposit when injected into asymptomatic oysters. The bacterial etiology hypothesis for JOD should be explored further, expanded beyond the family Vibrionaceae, and should include consideration of a multiple etiology.

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